Lane County Guide to Green Building
– *Working Draft* – December 3, 2002

Prepared By The UO Program for Watershed and Community Health

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What is Green Building?

The Green Building Initiative operated by the City of Portland, Oregon, defines green building as *"innovative building and site design techniques that improve the quality and performance of buildings while simultaneously reducing stress on the environment."* Green building utilizes a wide set of design standards, building techniques, and alternative materials that provide for energy and water efficiency, low toxicity, increased livability, and decreased waste production. Green building practices not only preserve the environment, they provide quality comfortable living, and long-term cost savings.

Everyone benefits from Green Building. Architects and contractors benefit from the marketability of green homes and buildings, and because green buildings promise lower future utility bills, buyers can spend more on the structure. Homeowners benefit, because green homes use less electricity, water, and sewer capacity, saving a typical homeowner about $500 each year. Preferential mortgage rates may become available for green-built homes. Businesses and commercial tenants of green buildings pay up to 35 percent less for lighting, heating & cooling, water, and sewer. Their workers often are more productive because they are exposed to fewer toxic building materials and work in natural light. Taxpayers and ratepayers benefit, because conserving electricity and water lowers the need for expensive new dams and power plants.

Elements of Green Building

- **Energy-saving practices** reduce the amount of electricity, natural gas, and oil used for space heating, water heating, and lighting of homes and offices. Particularly innovative techniques include furnaces equipped with clock thermostats, skylights for closets and dark hallways, office occupancy sensors, triple-glazed windows, and energy-efficient appliances.
- **Water-saving practices** reduce water use indoors and outdoors. To manage water consumption, a green building incorporates low-flow showerheads, aerating faucets, low-flow toilets, and high-efficiency washers. Outside water systems collect rainwater from roofs and reuse household gray water for lawns and gardens.
- **Pollution and toxicity-reducing practices** limit the use of toxic building materials, such as particleboard and cabinetry made with formaldehyde glues. Reducing pollutants is also important outside of the home or office. Green builders substitute native plants for exotic plants in landscape designs, which decreases the need for environmentally harmful (and expensive) fertilizers and pesticides.
- **Stormwater runoff-reducing practices** limit the amount of stormwater that surges into streams during rains, primarily by retaining stormwater on-site and reducing the amount of impervious surface on the property. Techniques include on-site drainage ponds, rainwater catchments and the use of pervious materials, such as gravel or crushed stone, rather than asphalt or concrete.
- **Erosion-control practices/landscaping** use natural vegetation and other measures to reduce the amount of harmful silt and sediment that enters waterways.

- **Forest-conserving** practices are based on the three “Rs”—Reduce, Reuse, and Recycle—and these practices lower the demand for new timber and other natural resources. They include advanced framing systems that use less timber, salvage reused timber, and use timber from sustainably harvested and certified forests.
- **Reducing construction waste & jobsite recycling** - You can save on waste disposal costs by separating and recycling wood, metal scrap, cardboard, drywall, asphalt roofing, concrete/asphalt. Designate an area within site to collect scrap materials for onsite reuse later in the project.
- **Infrastructure** – Sewer systems and pipes can be reduced in size and made cheaper when water conservation measures, rain water collection and gray water collections systems are utilized on larger developments. Also, when planning developments, depending on the site, wetlands can be constructed to treat some of the gray or black water.
- **Design -** One of the most important elements of green building is the design. A site assessment should be done to determine climate, sun location, shade, native vegetation, and soil type. The site assessment can be used to develop a design and orientation that utilizes all of these factors to increase efficiency.
- **Materials selection** - There are many alternative materials that can be used in building that can function as well or better than traditional materials. These materials can be more efficient, utilize recycled materials, and/or reduce waste. Use products that use local content and local labor, and use regionally appropriate materials. Consider maintenance and replacement costs over the life of the building. Use the life cycle costs to determine which products to use. Materials, their descriptions, price comparisons, and suppliers are listed below.

Addressing the Cost Issue

Of the products presented in this guide, 27% of them were found to be the same price, 5% cost less, and 67% cost more. Of the products that cost more, 24% of them had higher durability than traditional products, 35% were products that increased efficiency and had reasonable payback periods, and 5% were non-toxic products. Costs will continue to come down as demand for these products increase and the market expands. Costs will also go down as the learning curve becomes reduced for architects and designers.

SUPPLIERS, MATERIALS, AND COST COMPARISONS

This is an incomplete list of suppliers and materials. Traditional materials are in italics. All prices are estimates based on December 3, 2002, and are not guaranteed. Suppliers are in Eugene/Springfield unless otherwise noted.

WOOD & WOOD SUBSTITUTES	SUPPLIERS	PRICE
Sustainably Harvested Wood – SmartWood - Forest Stewarship Council (FSC) certified – Lumber – hard wood and soft wood	Cascadia Forest Goods LCC (Cascadia); Tree Products Hardwoods, Inc. (Tree Products); Home Depot	Prices are competitive and vary according to volumes, grades and dimensions. FSC wood products are typically priced the same as traditional wood and sometimes up to 11% higher due to tracking costs. To find a wide range of sources for FSC certified wood contact: Terry Campbell, Certified Forest Products Council, 503-224-7696, terry@certifiedwood.org..
Moldings	Cascadia; Tree Products; Home Depot	
Decking	Cascadia;	
Fencing & Landscape timbers	Cascadia; Home Depot	
Face Veneers	Cascadia;	
Plywood	Tree Products; Home Depot	
Paneling	Cascadia; Home Depot	
Wood Flooring	Cascadia; Tree Products	
Recycled Glue-lams	Cascadia;	
Siding	Cascadia;	
Reclaimed Lumber	Cascadia; Bring Recycling	Prices vary
Fiber Cement Siding – Hardiplank – Highly durable, non wood, non PVC, less maintenance, and lasts longer.	Jerry's; Home Depot	$3/ sq foot compared to vinyl siding at $1-2/ sq ft
Finger-Jointed Studs	None found	Currently higher priced than solid woods
Straw board (Isobord; Wheatboard)	None found in valley; Environmental Building Supply, Portland	¾ "- $0.64/sq ft
Homasote-100% recycled newsprint / insulating	Not found	
Steel framing – light guage steel - easily recyclable interior framing	Schnitzer Steel	Up to $3000 more to frame an average sized home. Cost per sq ft can be equal to wood framing 75% of the time

WOOD & WOOD SUBSTITUTES Cont'd	SUPPLIERS	PRICE
Structural Insulated Building Panels - expandable polystyrene, EPS, sandwiched between two panels of oriented strand board, OSB. (Enercept; Panel Pro)	Panel Pro, Western States Market Development & Sales.	Costs a few $1000 more per house, but money can be saved in labor; it will save up to 50% on energy bills.
Recycled plastic lumber for decking & furniture (Trex®, ChoiceDek, SmartDeck, Nexwood) Supports the young growing market for recycled plastic and avoids the harvesting of wood.	New Century Northwest; Jerry's	$1.70 - 1.90 foot, which is 2-3 X's more than standard pressure-treated wood

CONCRETE	SUPPLIERS	PRICE
Fly Ash Concrete - Fly ash is a by-product of coal-fired electric generating plants.	Most bldg supply stores like Home Depot, Jerry's, and more.	$6.45/ 50 lb bag
Slab On-Grade, Colored Concrete - Colored concrete is dyed and scored to look like tile.	You can buy stain to add to concrete at most bldg supply stores.	$3/ lb for the stain; $3/ sq ft of finished floor
Conventional Concrete/Portland Cement	Most bldg supply stores	$2.50/ 50 lb bag

WOOD TREATMENT	SUPPLIERS	PRICE
Use pressure treated wood over treated wood, which contains toxic arsenic.		
ACZA treatment – less toxic than CCA	JH Baxter	$195/1000 bd ft
ACQ treatment – no arsenic, least toxic	JH Baxter	$180/1000 bd ft
Natural Select – copper based non-toxic	Cascadia Forest Goods, LLC	Call for estimate
Convential CCA treated wood		$145/1000 bd ft

FLOORING	SUPPLIERS	PRICE
Cork flooring	Imperial Floors	$5.00-9.65 sq/ft
Bamboo flooring	Imperial Floors	$4.75-10.00 sq/ft
Natural Linoleum	Imperial Floors	$2.95-4.25 sq/ft
Ceramic Tile	Imperial Floors	$1.99-6.00 sq/ft
Stone Tile	Imperial Floors	$6.00-29.00 sq/ft
FSC Certified Hardwood – Madrone, Oregon White Oak, Maple, Alder, Doug Fir	Cascadia; Tree Products	$3.25-6.50 sq/ft (prices vary; 0-11% higher)
Recycled/Reclaimed Hardwood (floor or bleacher wood)	Cascadia; Scott @ Sunami Books	$1.00-4.00 sq/ft compared to $6 sq ft for traditional wood floor
Traditional Vinyl flooring	Most flooring stores	$1-10/ sq ft

CARPET	SUPPLIERS	PRICE
Use water-based, non-toxic, low voc adhesives for carpets, linoleum, and general construction		
100% Recycled cotton carpet padding	None found	
100% Wool carpet	Most carpet suppliers, Imperial Floors, Di's Carpet Store	$2.20-10.99 ($5 ave) sq/ft
100% recycled PET carpet	Most carpet suppliers	$1.33-3.22 sq/ft
Natural Fiber		$1.77-6.67 sq/ft
Carpet Tile - Less waste to install; low maintenance; replace only worn tiles.	Rubenstein's	$1.70 – 3.00 sq/ft
Traditional Nylon Carpet	Most carpet suppliers	$1.30-4.75 sq/ft

HEATING & COOLING SYSTEMS	SUPPLIERS	PRICE
Hydronic Heating/Warmboard – 30% more efficient	Jen Wen, Klamath Falls	$4 sq ft; 3-6 yr payback
Hydronic Fan Heating System	Turbonics, Western Washington	3-6 yr payback
Energy Recovery Ventiliation	Controlled Environments, Bend	2-5 yr payback

ALTERNATIVE HOT WATER HEATERS	SUPPLIERS	PRICE
Solar Water Heaters	Energy Service Co; TR Strong, Olympia, WA	$1500 - $3000 (includes installation) 4-8 yr payback
Demand (Tankless/Instantaneous) Heaters (Rinnai; Instant Flow)	Jerry's; Home Depot; James Heating & Home Comfort	$400
Drainwater Heat Recovery System	Energy Outlet	$200-$600
High Pressure Water Conserving Devices (Nibco)	Consolidated Supply; Most plumbing supply stores	Prices vary

PAINT, CAULKING, SEALING & ADHESIVES	SUPPLIERS	PRICE
Look for low voc paints and recycled paint, and recycle any leftover paint; use no or low VOC, water-based, least toxic adhesives		
Paint – low voc; non-lead; non-mercury	Most paint suppliers, Forrest Paint, Tommy's Paint Pot, Miller Paint; Greater Goods	$25/ gal
Sealants & Adhesives –non-toxic (AFM Safecoat brand)	Greater Goods; Environmental Building Supply, Portland	$35/ gal
Stain – low voc	Greater Goods; Environmental Building Supply, Portland	$80/ gal
Recycled paint	None found; Environmental Building Supply, Portland	$6 – 10/ gal
Traditional Paint	*Most paint supply stores*	*$10 – 30/ gal*

WINDOWS	SUPPLIERS	PRICE
High Performance Windows – Double pane or Triple pane. Provide insulation up to R-5+	Most Window Suppliers	$225/ 3x5 ft
Low-Emissivity (Low-e) Coatings, Double pane – allow visible light in, but block heat from passing through, R-2.3	Most Window Suppliers	$240 ave/ 3x5 ft
Gas Fills – inert gas filled windows that act as an insulator, R-2.6	Most Window Suppliers	$240 ave/ 3x5 ft
Superwindows – up to R-6, the most efficient window incorporating many technologies (gas, low-e, airtight, etc)	Most Window Suppliers	$360/ 3x5 ft Most efficient in cold climates (14 year payback)
Standard Double pane, R-1 to R-2	*Most Window Suppliers*	*$190 – 205/ 3x5 ft*

LIGHTING	SUPPLIERS	PRICE
Compact Fluorescents	Most building supply stores	$12 ave (1.6 yr payback)
Tube Fluorescents	Most building supply stores	$20-30
Halogens	Most building supply stores	$5-6
Improved Incandescent light bulbs	Most building supply stores	$3 ave
Solar Powered Security and Yard Lights	Most building supply stores	$75 for each system
Incandescents	Most building supply stores	*$0.75*

INSULATION	SUPPLIERS	PRICE
Cellulose; Icynene (75% recycled newsprint)	Controlled Environments, Bend; Sray Foam, Brush Prairie	Higher priced than fiberglass
Cementitious Foam Insulation - high R value	None in the valley	$0.30/ bd foot
Recycled cotton insulation (Bonded Logic)	None in valley; Environmental Building Supply, Portland	$0.56 – 0.78 sq/ft
Recycled Newsprint (Cocoon, GreenFiber)	None found	
Traditional Fiberglass Insulation	*Most insulators*	*$.10 / bd foot*

ROOFING	SUPPLIERS	PRICE
Whenever possible use a metal roof with recycled content; when using shingles, use materials with recycled content and 40-50 year life expectancy		
Asphalt Shingles	Most building supply stores	$25 - 30/ sq (life=15-30 yrs)
Cedar Shakes	Most building supply stores	$95 - 170/ sq (15-30 yr)
Clay Tile	Most building supply stores	$200 - 500/ sq (50 yr)
Slate	Most building supply stores	$320 – 1000/ sq (50-100 yr)
Fiber Cement Composite Tiles	None found	$200 - 600 / sq (30-50 yr)
Metal	Most building supply stores	$155 – 31/ sq (20-50 yr)

Suppliers

General Building Supply

Environmental Building Supply; 503/222-3881; NW 13th & Kearney; Portland, OR

Home Depot; 344-1312; 1045 Green Acres Rd.

Greater Goods; 485-4224; 515 High

J.H. Baxter Co; 689-3020

Jerry's; 689-1911; 2600 HWY 99 North

New Century Northwest; 342-4500; 775 Vincent St

Schnitzer Steel; 686-0515

Bring Recycling; 746-3023; 86641 Franklin Blvd.

Lumber/Wood products

Cascadia Forest Goods, LLC; 485-4477; Mike Barns; 2844 Adams Street

Panel Pro; Western States Market Development &Sales; 895-2679; Cal Drake; PO Box 856; Creswell, OR

Scott @ Sunami Books; 345-8986 (sells reclaimed bleacher wood and gym floor wood)

Tree Products Hardwoods, Inc.; Dan Shutes; 689-8515

Flooring/Carpet

Di's Carpet Store;741-6233; 770 Q St.

Imperial Floors; 342-5031; 355 Lincoln

Rubenstein's Contract Carpet; 484-1101; 160 Cleveland

Paint

Forrest Paint Co.; 868-1222; 990 McKinley

Miller Paint; 431-4444; 990 Garfield

Tommy's Paint Pot; 342-4277; 1647 Coburg Rd.

Heating/Hot Water

Consolidated Supply Co; 688-7621; 110 N. Garfield

Controlled Environments; Randy & Louise Nicklas; 800/784-9017;19454 Sunshine Way; Bend, OR 97702

Energy Outlet; 683-5060; 409 High Street

Energy Service Company; 302-6808; 399 E. 10th

Home Comfort Heating & Air; 345-2838; 706 Oscar

James Heating & Home Comfort; 461-2101; 115 Lawrence

Jen-Wen; 3250 Lakeport Blvd; Klamath Falls, OR 97601; 800/535-3462; Barry LaDuke; 503/353-1608

TR Strong Building Systems; 360-705-2868; Olympia, WA

Turbonics; 425/487-6272; 216/741-8300; www.bio-radient.com

Windows

EMDG Sales; 688-9765; 525 HWY 99 North

Emerald Door & Glass Inc; 485-0497; 722 Wilson St.

Energy III; 741-3906

Pella Window & Door Co; 683-8170; 965 Tyinn #20